

The Geitonoplesiaceae Dahlgren ex Conran (Liliiflorae: Asparagales): A new family of monocotyledons

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Abstract

Conran, John G. (Department of Botany, The University of Adelaide, South Australia 5005, Australia) 1994. The Geitonoplesiaceae Dahlgren ex Conran (Liliiflorae: Asparagales): A new family of monocotyledons. *Telopea* 6(1): 39–41. The monocot family name Geitonoplesiaceae Dahlgren ex Conran is validated and circumscribed to include the two monotypic genera *Geitonoplesium* and *Eustrephus*.

Although the name Geitonoplesiaceae was proposed by Dahlgren (1980) for the family containing *Eustrephus* R.Br. ex Ker Gawler and *Geitonoplesium* A.Cunn. ex Hook., it was not validly published. Nevertheless, as the taxon is sometimes accepted, and its name has been or is being used in the literature (Clifford et al. 1992; Laferrière in prep.; Conran in press), the validation of the *nomen nudum* Geitonoplesiaceae is necessary.

Geitonoplesiaceae Dahlgren ex Conran, fam. nov.

Frutex scandens vel effusus caulibus, usque ad 10 m altis; radix e rhizomata exorians, tuberosa vel fibrosa; caules foliacei. Folia alterna, disticha, ovata vel lineara, interdum resupinata, plurinervosa; nervo centrali prominente. Flores hermaphroditi, 1 vel numerosi, pedicellati in cincinnae dibrachiae cymae vel floribus axillaribus vel terminalis solitariis; pedicellis articulatis. Segmenta perianthii 6 (3+3), subaequalia, $\pm$ libera; petala interdum fimbriata. Stamina 6; filamenta libera vel connata; antherae biloculares, introrsae, poris terminalibus dehiscentes. Ovarium sessile, superum; ovula plura, pendula, campylotropa. Fructus bacca vel capsula succulenta. Semina pauca vel numerosa, nigra, interdum arillata; endospermum non-amylaceum.

Type: *Geitonoplesium* A. Cunn. ex Hook., *Bot. Mag.* 59: t. 3131 (1832).

Perennial, rhizomatous slender sub-shrubs or scrambling to twining vines with roots fibrous (*Geitonoplesium*) or fusiform and swollen to tuberous (*Eustrephus*). Stems thin, branching, climbing to 10 m. Leaves alternate, distichous, sessile to shortly petiolate, without a sheathing base; blades ovate to lanceolate or sometimes linear or $\pm$ grass-like, sometimes resupinate (*Geitonoplesium*); veins numerous, parallel, close, with no or few cross veins, midrib prominent. Inflorescence a terminal or axillary cincinnus, dibrachium, or the flowers borne singly in leaf axils. Flowers bisexual, small, hypogynous, actinomorphic, articulate on the pedicels, usually with a pericladium; perianth marcescent, not twisted after anthesis; tepals in two whorls of 3, subequal, free, white or pale pink to mauve, with inconspicuous nectaries at the base; inner tepals sometimes with fimbriate margins (*Eustrephus*). Stamens 6 in two whorls; filaments free (*Geitonoplesium*) or basally connate (*Eustrephus*); anthers bithecate, tetrasporangiate, basifixed, introrse, dehiscing by apical pores; pollen grains shed singly, monosulcate (*Eustrephus*) or trichotomosulcate (*Geitonoplesium*). Gynoecium of 3 united carpels, ovary 3-locular; ovules several, campylotropous, in 2 rows on intrusive axile placentas; style single, erect, with an apical capitate stigma.

Fruit a berry (*Geitonoplesium*) or a fleshy capsule (*Eustrephus*). Seeds several, rounded to angular-crescentic, black and shiny with a phytomelan crust, sometimes arillate-strophiolate (*Eustrephus*); endosperm copious, without starch; embryo linear, 1/3–2/3 as long as the seed. $2n=18$ for *Eustrephus* (Stenar 1952) and $2n=20$ for *Geitonoplesium* (Conran 1985).

Distribution: A family of two monotypic but highly variable genera from E. Australia, Timor, Eastern Malesia, New Guinea, New Caledonia and Pacific Islands; *Eustrephus* is naturalised in Java. Numerous infraspecific taxa were described within each species by Schlittler (1951), but none of these was found by Conran (1987) to be biologically distinct.

Habitat: *Eustrephus* and *Geitonoplesium* show wide habitat ranges from tropical and temperate rainforest to dry sclerophyll forests. Both genera grow as vines in rainforest and moist forest, but as bushes in dry and exposed situations. *Eustrephus* is common along railway reserves in north-eastern Australia. The vegetative phenology of both genera in south-eastern Queensland has been described by Conran (1988; 1991).

Notes: The family appears to be most closely related to the Phormiaceae, Ruscaceae, Herreriaceae and, less closely, the Luzuriagaceae, all in the Asparagales (Conran 1987; 1989). Porate anthers link the Geitonoplesiaceae with the Phormiaceae, and the presence of phytomelan in the seeds relates both of them to the more advanced families of the Asparagales. The inclusion of the Geitonoplesiaceae with the Luzuriagaceae in the largely reticulate-veined and highly heterogeneous Smilacaceae of Cronquist (1981) or the Philesiaceae sensu Takhtajan (1980) and Dahlgren and Clifford (1982) is not presently supported, and the relationships of this group of southern Asparagalean families is the subject of current molecular phylogenetic studies.

References

- Clifford, H.T., Conran, J.G. & Thongpukdee, A. (1992) Australian lilies: native and naturalised species. *Austral. Pl.* 16(132): 335–377.
- Conran, J.G. (1985) Chromosome number reports on Colchicaceae, Petermanniaceae and Philesiaceae (IOPB Chromosome number reports 87, ed. Å. Löve). *Taxon* 34: 346–347.
- Conran, J.G. (1987) A phenetic study of the relationships of the genus *Drymophila* R. Br. within the reticulate-veined Liliiflorae. *Austral. J. Bot.* 35: 283–300.
- Conran, J.G. (1987) Variation in *Eustrephus* R.Br. ex Ker Gawler and *Geitonoplesium* Cunn. ex R.Br. (Asparagales: Luzuriagaceae). *Muelleria* 6: 363–369.
- Conran, J.G. (1988) The reproductive and vegetative phenology of some south-east Qld rainforest monocotyledons. *Proc. Roy. Soc. Queensland* 99: 35–43.
- Conran, J.G. (1989) Cladistic analyses of some net-veined Liliiflorae. *Pl. Syst. Evol.* 168: 123–141.
- Conran, J.G. (1991) A study of the phenology of some rainforest monocotyledons. Pp. 129–140, in Werren, G.L. & Kershaw, A.P. (ed.), *Australian National Rainforest Study Report Volume 2*. (Australian Government Publishing Service: Canberra)
- Conran, J.G. (in press) Geitonoplesiaceae. In Kubitzki, K. (ed.), *The Families and Genera of Flowering Plants*. (Springer Verlag: Berlin)
- Cronquist, A. (1981) *An Integrated System of the Classification of Flowering Plants*. (Columbia University Press: New York)
- Dahlgren, R.M.T. (1980) A revised classification of the angiosperms. *Bot. J. Linn. Soc.* 80: 91–124.
- Dahlgren, R.M.T. & Clifford, H.T. (1982) *The Monocotyledons: A Comparative Study*. (Springer Verlag: Berlin).
- Laferrière, J.E. (in prep.) Geitonoplesiaceae. *Fl. Malesiana*
- Schlittler, J. (1951) Die Gattungen *Eustrephus* R.Br. ex Sims und *Geitonoplesium* (R.Br.) A.Cunn. Morphologische-anatomische Studie mit Berücksichtigung der systematischen, nomenklatorischen und arealgeographischen Verhältnisse. *Ber. Schweiz. Bot. Ges.* 61: 175–239.

- Stenar, H. (1952) Notes on the embryology and anatomy of *Luzuriaga latifolia* Poir. *Acta Hort. Berg.* 16: 219–232.
- Takhtajan, A.L. (1980) Outline of the classification of flowering plants (Magnoliophyta). *Bot. Rev.* 46: 225–359.

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